



## Stilgebauer Award 2010 – Application Form

Please provide the information below. This application form needs to accompany the Project Summary for the project to be considered for a Stilgebauer award. Individuals or teams may complete the required information for their own project(s) or for another teacher or group's project

Project Name: <i>Scratch the Surface of Engineering.</i>	
School Regional Area	<input checked="" type="checkbox"/> North Cook <input type="checkbox"/> South Cook <input type="checkbox"/> West 40
District Name	<i>Northbrook School District #28</i>
District No.	<i>#28</i>
Name(s)-Teams with up to 5 members will be accepted! Include all names.	Email Address(s)
* <i>Sarah Wippman</i>	* <i>swippman@northbrook28.net</i>
* <i>Susan Joyce</i>	* <i>sjoyce@northbrook28.net</i>
* <i>Laurie Korte</i>	* <i>lkorte@northbrook28.net</i>
*	*
*	*
School Name	<i>Westmoor</i>
School Street Address	<i>2500 Cherry Lane</i>
School City, State, Zip	<i>Northbrook, IL 60062</i>
School Phone Number	<i>847-498-7960</i>
If you are providing information to nominate another teacher or group, please provide your information below (if different from those named above).	
Nominator's Name	
Nominator's Phone #	
Best Contact Time	
Nominator's Email	

Please attach the Project Summary to this form and send to Learning Technology Center One Central at 2701 W. Washington Blvd., 2<sup>nd</sup> Floor, Bellwood, IL 60104

1. Scratch the Surface of Engineering
2. Students use the Scratch Program to design Robots for a specific purpose to make a "job" easier or more functional. After programming the movements using Scratch, the students build the specified robot and test their job.
3. Grade Levels: 3<sup>rd</sup>-5<sup>th</sup> grade
4. Subject Areas: Math, Science, Technology, Language Arts
5. Technology Resources: Scratch Program, Pico Cricket Robotics, Skype (to speak to Professionals in the field), Podcasts, Voice Thread
6. Other Materials used: recyclable items to build the robots, You Tube expert
7. Standards

### **ISTE**

1. Facilitate and Inspire Student Learning and Creativity-teachers use their knowledge of subject matter to facilitate experiences that advance student learning, creativity and innovation in both face to face and virtual environments.
2. Design and Develop Digital-Age Learning Experiences and Assessments  
Teachers design, develop, and evaluate authentic learning experiences and assessments incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the NETS•S. Teachers:
3. Model Digital-Age Work and Learning  
Teachers exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society.
4. Promote and Model Digital Citizenship and Responsibility  
Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices
5. Engage in Professional Growth and Leadership  
Teachers continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources.

### **Illinois Learning Standards**

#### **Math**

- State Goal 6-Demonstrate and apply a knowledge and sense of numbers, including numeration and operations, patterns, ratios and proportions.
- State Goal 7-Estimate, make and use measurements of objects, quantities, and relationships and determine acceptable levels of accuracy.
- State Goal 8-Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems and predict results.
- State Goal 9-Use geometric methods to analyze, categorize and draw conclusions about points, lines planes and space.
- State Goal 10 C-Determine, describe and apply the probability of events

#### **Science**

- State Goal 11 A-Know and apply the concepts, principles and processes of scientific inquiry B-Know and apply the concepts principles and processes of technological design

State Goal 12 C-Know and apply concepts that describe the properties of matter and energy and the interactions between them D-Know and apply concepts that describe force and motion and the principles that explain them

Sate Goal 13 A Know and apply the accepted practices of science. B-Know and apply the concepts that describe the interaction between science, technology and society.

### **Language Arts**

State Goal 4-Listen and speak effectively in a variety of situations

#### **8. Process**

Students participating in the Robotic Group were asked to design a prototype to solve a real problem. First, students sketched ideas on paper. Next they became familiar with the Scratch program so they could create a virtual sprite and give it commands. The last step was to create the prototype and program the robot to do the specific job it was designed to do. Through experimentation and discussion, students made discoveries through trial and error, and persistence. Students formulated a hypotheses about how their robot would react, programmed the robot and made modifications if their intended outcome was different. On their own, students sought to change, modify, experiment and dabble in the science of velocity, resistance, movement, gravity all the while programming movements, sound and touch in the scratch program.

9. Integration-The most amazing aspect of this learning opportunity was the discovery made by the students as they experimented to create their robot. Each team learned to collaborate, and to think differently about outcomes that were not as planned. Modifications were made to create new or different shapes with the 3-dimensional model, as well as the Scratch program. Students "discovered" when something was too heavy, or moved too fast or slowly to complete the given task. Each student learned patience, perseverance and wondered at the possibility at what they had created and could create in the future. We have also made a connection to Professor of Robotics at Illinois Institute of Technology who is willing to discuss and explain the real world implications of robotics.

#### **10. Reflection**

This project has greatly impacted my teaching in many ways. These students will need to be prepared for a future with many unknowns. In order to compensate for this, they will need to learn to be flexible and adaptable. It was transformational for us to see the students with a bag of "junk" and turn this into a usable tool. Imagine these implications for the future? By working collaboratively to solve a real world issue, these students demonstrated that they are able and willing and motivated to put in the time and effort necessary to problem solve. Additionally, each student will have the opportunity to self-assess and explain their project with a podcast. These interactive real life problems are so much more meaningful to the students and sparked their interested for the entire duration, and most begged to stay after school to continue working on the robot. This is their future and we need to make sure that our students have the opportunity for these engaging activities which promote deep thinking.